

ABSTRACT

A monolithic single pass expanded beam mode active optical device includes: a substrate; a waveguide layer coupled to the top surface of the substrate; a semiconductor layer coupled to the waveguide layer; first and second electrodes for receiving an electric signal coupled to the substrate and the semiconductor layer, respectively. The waveguide layer includes a plurality of sublayers, forming a quantum well structure, which is responsive to the electric signal. The waveguide layer has three sections, two expansion/contraction sections and an active section, which extends between and adjacent to the two expansion/contraction sections. The thickness of at least one of the plurality of sublayers varies within the expansion/contraction portions of the quantum well structure. Possible interactions of the active region with the light include: absorption in the case of an electro-absorptive modulator and optical gain.